

What is Claimed is:

1. An air conditioning system comprising:

an outdoor unit having a compressor and an outdoor heat exchanger;

an indoor unit installed in a ceiling, having an indoor heat exchanger with a space therein in communication with a room, a fan in the space for drawing air and discharging through the indoor heat exchanger, and a ventilation guide duct on an underside of the indoor heat exchanger having a partition wall for separating external air supplied from an outside of the room, and room air, for guiding the external air to the room through the fan, and the room air to the outside of the room;

an air supply duct and an air discharge duct each having one end connected to the ventilation guide duct for guiding the external air to the room, and the room air to the outside of the room, respectively; and

a preheat exchanger provided in the middle of the air supply duct and the air discharge duct, for indirect heat exchange of the external air and the room air passing through the air supply duct and the air discharge duct.

2. The air conditioning system as claimed in claim 1, wherein the fan includes a centrifugal fan that draws air from under and discharges in a radial direction as the fan rotates.

3. The air conditioning system as claimed in claim 1, wherein the ventilation guide duct includes;

a first flow passage in communication with the space, the room, and the air supply duct, for guiding the room air and the external air to the fan,

at least one or more than one second flow passage for guiding the air passed through

the fan and the indoor heat exchanger to the room, and

a third flow passage for guiding the room air to the air discharge duct.

4. The air conditioning system as claimed in claim 3, wherein the ventilation guide duct includes;

a duct body on an underside of the indoor heat exchanger, and

a panel attached to an underside of the duct body.

5. The air conditioning system as claimed in claim 4, wherein the duct body includes;

a first hole passed in an up/down direction to form a part of the first flow passage and in communication with the air supply duct,

a third hole passed in the up/down direction to form a part of the third flow passage, in communication with the air discharge duct, and made independent from the first hole by the partition wall, and

a second hole passed in the up/down direction to form a part of the second flow passage.

6. The air conditioning system as claimed in claim 4, wherein the duct body includes;

first ducts arranged to surround a central part to form a cavity in the central part that is in communication with the space and the room, each of the first ducts having an inside forming a part of the second flow passage, and

the partition wall arranged to divide the cavity into the first flow passage and the third flow passage.

7. The air conditioning system as claimed in claim 6, wherein the partition wall has opposite two ends connected to opposite first ducts.

8. The air conditioning system as claimed in claim 6, wherein the partition wall divides the cavity into two flow passages having the same forms and sectional areas.

9. The air conditioning system as claimed in claim 6, wherein the duct body further includes connection plates connected between side ends of adjacent first ducts, and the air supply duct or the air discharge duct is connected thereto selectively.

10. The air conditioning system as claimed in claim 4, wherein the panel includes; a first port formed to form parts of the first and third flow passages, respectively, and a second port formed to form a part of the second flow passage.

11. The air conditioning system as claimed in claim 10, wherein the panel further includes a mesh provided to the first port.

12. The air conditioning system as claimed in claim 10, wherein the panel further includes a plurality of louvers provided to the second port for guiding a discharge direction of the air passed through the indoor heat exchanger.

13. The air conditioning system as claimed in claim 5, wherein the fan is provided over the first hole and the third hole.

14. The air conditioning system as claimed in claim 5, wherein the indoor heat exchanger stands on the duct body along positions between the first hole and the second hole, and the first hole and the third hole.

15. The air conditioning system as claimed in claim 1, wherein the preheat exchanger includes;

first guide passages arranged at regular intervals for flow of the external air therethrough, and

second guide passages arranged to be in contact between the first guide passages for flow of the room air therethrough.

16. The air conditioning system as claimed in claim 1, wherein the preheat exchanger includes;

a plurality of plates arranged at regular intervals so that the first guide passages for flow of the external air and the second guide passages for flow of the room air are formed in layers, and

a plurality of flow guides provided between the plates for each of the layers in parallel to flow directions of the external air and the room air respectively, each having a cross section with a plurality of continuous folds.

17. The air conditioning system as claimed in claim 16, wherein the fold includes a perk and a bottom in contact with a top surface and a bottom surface of the plates.

18. The air conditioning system as claimed in claim 16, wherein the flow guides in

each of the layers are arranged perpendicular to each other such that the external air and the room air flow in perpendicular to each other.

19. The air conditioning system as claimed in claim 1, further comprising an air supply fan mounted on the air supply duct for supplying the external air to the room.

20. The air conditioning system as claimed in claim 1, further comprising an air discharge fan mounted on the air discharge duct for discharging the room air to the outside of the room.

21. The air conditioning system as claimed in claim 3, wherein the air supply duct and the air discharge duct include at least one or more than one branch ducts branched from one ends thereof and connected to the first flow passage and the third flow passage.